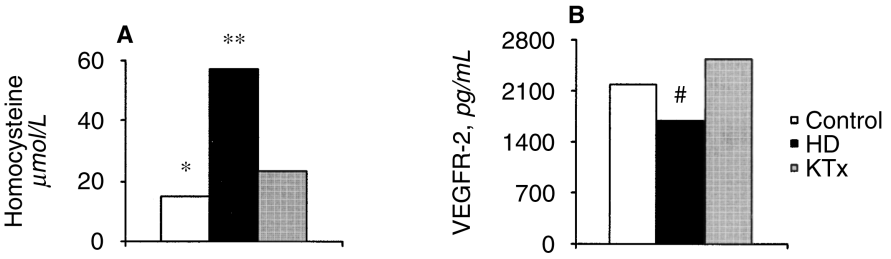

Fig. 1. (*A*) Homocysteine and (*B*) vascular endothelial growth factor 2 (VEGFR-2) serum levels in control, hemodialyzed (HD), and kidney transplanted (KTx) patients. $*P < 0.05$ vs. KTx patients; $**P < 0.001$ vs. KTx and control patients; $\#P < 0.001$ vs. KTx patients and $P < 0.014$ vs. control patients.

the renin-angiotensin system. Therefore, specific dosage of ACE-I and ARBs may be required to obtain maximal renoprotective effects in various populations. Unfortunately, the optimal dosage of ACE-I has only been investigated in Japanese patients with nonrenal disease [1].

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Inverse association between homocysteine and vascular endothelial growth factor receptor 2 serum levels in hemodialyzed and kidney transplanted patients

To the Editor: Homocysteine has an inhibitory effect on angiogenesis [1]. However, the vascular endothelial growth factor receptor-2 (VEGFR-2) gene has recently been found up-regulated on human atherosclerotic plaques [2]. In order to analyze the association between homocysteine and VEGFR-2 serum levels, we have randomly selected 26 regular hemodialysis (HD) patients ages 56 ± 12 years (mean ± SD; M = 14, F = 12), and 26 age-matched kidney transplanted individuals (KTx), ages 52 ± 8 years (M = 21, F = 5). KTx transplant age was 13 ± 9 months and creatinine was 1.6 ± 0.5 mg/dL. Nine age-matched healthy volunteers (47 ± 5 years) were also recruited. HD samples were collected at the end of the long interval period. Serum homocysteine (Hcy) and VEGFR-2 were tested by high-performance liquid chromatography (HPLC) with fluorimetric detection and a commercial enzyme-linked immunosorbent assay (ELISA) kit, respectively. Hcy was higher in HD patients (57 ± 36 μmol/L) than in KTx patients (23 ± 8 μmol/L; $P < 0.001$) and control patients (15 ± 6 μmol/L; $P < 0.01$ vs. HD; $P < 0.05$ vs. KTx). VEGFR-2 was lower in HD patients (1705 ± 387 pg/mL) than in KTx patients (2449 ± 825 pg/mL; $P = 0.014$) or control patients (2150 ± 464 pg/mL) (Fig. 1). The present study shows that Hcy and circulating VEGFR-2 are inversely associated, consistent with previous reports showing that homocysteine inhibits angiogenesis. Our data also suggest that up-regulation of the VEGFR-2 gene is probably a local finding, and that hyperhomocysteinemia may be involved in the release of VEGFR-2 into the systemic circulation.

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